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Brief Discussion on the Significance of Local Undergraduate Colleges Financial Mathematics' Construction and Training Program Bid

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Abstract
This article combines the modification process from version 06 to version 12 training plan of our school's financial mathematics. It analyses the talent training scheme on financial mathematics which is collective. On the local college of mathematics and applied mathematics of financial mathematics application personnel training plan, it also puts forward some reform measures.

Key words: Financial mathematics; Training plan; Practice Teaching

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In the late 1980s and early 1990s, the crossing and blending of finance and mathematics had led to the production of the financial mathematics and financial engineering which is an applied, comprehensive, rising interdisciplinary field. The generation of financial mathematics and financial engineering discipline has brought a lot of benefits. For example, it has let the modern finance research not only has a more advanced theory, but also the theory combined with practice tightly, so that it can be more scientific and systematic solutions to complex reality of financial problems for the financial industry. Meanwhile, the discipline also lays a solid theoretical and technical basis for faster development of banking, better service to society. This interdisciplinary field has become a wonderful part of the international financial community. In addition, the development of financial mathematics and financial engineering had raised the Wall Street Revolution twice. The experts think the development that financial mathematics and financial engineering discipline may bring about should be occurred in Asia obviously, especially in China where the financial market is being developed and has tremendous potential.

Development Plan Outline for Medium and Long Term Reform Education Development (2010-2020) pointed out that, improving the quality of universities should be considered as the core task, nurturing of creative professionals, consummating the education and teaching management system, elevating the quality of talent cultivation, enhancing the level of scientific research, strengthening the ability of social service are important. With the rapid development of the national economy of China and the depth of each reform, the demands for the practical talents quality of society are increasing. As a result, traditional education mode which pays less attention to the practice with too much importance attached to the theory in the universities is faced with a rigorous challenge. So theory and practice of combining teaching, training both the theoretical foundation and practical skills of the applied talents has become the development direction of the teaching reform in colleges and universities. How to improve the teaching practice of financial mathematics, to train high-quality talents who are qualified with practical theory and have practical operation ability is a new task which the field has been facing with. In 2002, the Ministry of Education approved that five national universities (Renmin University of China, Central University of Finance and Economics, Wuhan University, Southwestern University of Finance and Economics and Xiamen University) can open the financial engineering for the first time. As for 2010, China had 48 universities opened financial engineering. Lots

of financial engineering have sprung up throughout the country in the past few years. It is no longer the patent of national key university. We have learned it that the profession in the domestic development is quite fast, it has strong vitality and development potential because it can survive and have been developing rapidly. The target of talents training between key university and college is differentiated. Key university and local institutions' quality of the graduates and employment of financial mathematics and financial engineering also has the difference. Thus, it has certain practical significance that we cultivate financial mathematics and financial engineering applied talents aimed at local colleges and local schools the characteristics of students in local colleges.

In foreign countries, cultivating applied talents in colleges and universities, financial mathematics and financial engineering curriculum has become the important content of student learning, especially as the microscopic financial is the main content of learning. Foreign applied mathematics professional development lays great emphasis on the theory and practice, improve students' practical and practice ability. Of course, this is inseparable from foreign economic development. In our university, financial mathematics and financial engineering is gradually formed and perfected. How to combine finance with mathematics so that we can cultivate applied type talents which meet social and economic needs has become an urgent research topic. From the actual training situation, the current financial mathematics and financial engineering talent training more still stays in merely finance professional knowledge and knowledge of mathematics theories, especially the local colleges and universities due to economic constraints are not completely obvious mathematics in economic and financial field advantage.

Local colleges shoulder the important task of cultivating the compound talents for their economic construction and social development. Mathematics and applied mathematics as one based major of the new local comprehensive colleges. Therefore, it is an emergent problem which has become a new local comprehensive colleges must be highly valued, that how to adapt to the development of financial mathematics, how to achieve a new round span through doing some corresponding adjustment, reform, development and innovation on the applied mathematics, professional setting, development direction the application scope and student training and other aspects to keep pace with the times in the fierce competition and tough challenges. Some our key universities currently have made great progress on financial mathematics and financial engineering applied talents, such as Nankai University, Shandong University, Peking University. They mainly have trained financial talents who adapt to the requirement of fast economic development and send a large number of professional personnel to the international well-known universities and enterprises. But their success cannot be copied directly for general local college for the reason that the key universities have a strong teaching and the superiority of regional economy which are incomparable for the general local universities. After investigation and interviewing lots of local securities company, Futures Company, insurance companies, banks and other financial institutions, we understand that the current Chinese stock market is booming and has a strong tendency of development. However, it also has some problems, such as lacking of professionals who work in the financial industry, especially those who are skillful in using mathematical software for economic data processing and prediction. Demands for financial mathematics and financial engineering talents are great in the local financial institutions. It is difficult to get outstanding comprehensive talents who graduated from key universities. Based on the local economic development conditions, they need financial mathematics and financial engineering graduates who have more strong ability. Unfortunately, graduates who have entered financial business have solid theoretical knowledge, but lack of practical and practice ability.

Above all, the training schedule is the top level design of talents training. In order to cultivate innovative talents, making a scientific training scheme must be combined with the professional characteristics of financial mathematics and local universities mathematics. In this paper, on the basis of a series of changes and modifications of the thinking aimed at training schedule which be made in the financial mathematics education in recent years, summarizes the related experience for extensive exchanges with other colleges.

We developed the first financial mathematics training programs in 2006. The training program is a transition from college to undergraduate. This is also a training program, a financial mathematics direction to the first financial mathematics. Due to lack of practical experience, making the training plan basically is the basis of the research, with reference to relevant institutions (key institutions) approach, combined with the actual situation of our college. After the 06 stage of the process of practice teaching, the training plan had been amended in 2009. It is characterized by some aspects, which are getting rid of some purely theoretical, difficult courses which contact less with major, such as intermediate macroscopic, intermediate microeconomics, physics and so on, increased the hours of practice, reduce big four courses, four just opened a course, three elective courses. In the cultivating goal of outstanding Mathematics Department of finance specialty, emphasizing the application of mathematics and mathematical modeling of the application, the data with mathematical knowledge processing, it is cannot be done by economy graduates. In addition, from the employment situation of 06, employment is mainly accounting, securities, insurance. So our goal is to let the students can use the mathematic in accounting,

securities, futures etc.. We think financial mathematics should pay equal attention to Mathematics in finance. The third amendment was in 2010, which is a major increase in practice teaching. The requirement is that direction courses should have a certain amount of practice teaching of course at least. The practical teaching can enhance the students' practical ability, innovation ability. Moreover, in order to pave the way for employment, we increase the mathematical characteristics of the course, for example, Actuarial Science, statistical software. Training target is noticeably constructed from the following two aspects: Mathematics in economic data processing, mathematical model of the application and the securities, insurance etc.. In the curriculum, financial statistics software is included in the professional courses. We strengthen students' practical ability of data processing in the major courses, increase the actuarial science, encourage and facilitate the students take the exam of actuary. The fourth amendment was in 2012, we increased practice teaching efforts in the cultivation project, including the curriculum practice teaching and practice for graduation. In particular, we also increased the union training class. The cultivation of applied talents must take the social demand as the guidance and ensure the quality of goals will have lasting vitality and a strong driving force. Revising a training plan is an effective way to unify the pursuit of professional self development and social needs. Through our continuous exploration and summary, we have made a mode that the cultivation scheme and formed a kind of taking subject competition (Mathematical Contest in modeling, mathematical knowledge competition, Challenge Cup competition) for grasper, knowledge and skills of both in class and after class activities, fusion, training program of teaching content, teaching method and dynamic tuning of continuous innovation of applied cultivating the creative ability of students.

The practice shows that, the cultivation plan of financial mathematics which is a major of mathematics and applied mathematics in our school is consistent with the characteristics of local colleges and universities, and in the past three years it has achieved fairly good results. The main performances as follows:

Firstly, it is better for the Department of mathematics and applied mathematics to carry out quality education, improve the quality of talent cultivation, and extend our professional students' knowledge. In order to improve students' professional skills, the employability and entrepreneurial capabilities, we attach great importance and encourage students to participate in various professional skills test. Thus we obtained satisfactory result: There are 54 students who have got the accountant certificate, passing rates accounting for 27%; 38 people have passed the securities practice qualification certificate, accounting for 26.3% to mathematical finance; 13 students have got the insurance certificate and bank qualification certificate.

Secondly, there are 145 parts about the direction of mathematical finance in graduation thesis. The selection of topics meets the professional training program, including the selection and practice of production reached 80%, and one part is selected from the students in the practice of the practical problems.

Thirdly, students who major in mathematical finance participate in the national mathematical modeling contest, the challenge cup contest, students' research learning and innovative experiment project, the mathematical knowledge contest, the English speech contest and other events. They have won three prizes in mathematical modeling of the above 15, the Challenge Cup Winners 12, mathematics knowledge contest won the provincial award 4; they have also got three projects belong to Hunan province approving research learning and innovative experiment. There are 8 papers which were published by students. 12% of the students had been admitted to the graduate students, most of which enter financial and economical school.

At last, it shows good momentum of students' employment. Each initial employment rate reached more than 85%, the main reason is with the development of economy, the demands of people who is good at both finance and the mathematic, especially can use mathematical tools to analyze the economic problem is bigger and bigger. In general the prefecture-level city securities from the company, Futures Company, to mathematical models in economic and financial applications for marketing highlights, and local universities financial mathematics graduates will make up the vacancy of talent market. However, according to our survey, we found that the employment of graduates has poor stability. Generally most would prefer to select a job hopping to work in a big company after two years. Over the last two years, the downturn of market economy also brought some impact on the financial mathematics students in the direction of employment.

As the development of Chinese economic reform and enterprise high-end talent training base, teaching means and methods are constantly leading the pursuit of style innovation in the system of education level. So it can meet the market demand for talents and develop the Mathematical Sciences in modern high-end economy industry advantage, major colleges and universities. The future development trend of financial market is bound to be accompanied by mathematics, statistics, computer technology development and the deepening and upgrading, derivative financial instrument creation, financial derivatives arbitrage analysis, analysis of the transaction, risk control and actuarial field of rapid development is inseparable from the open data integration, model analysis, simulation test and simulated trading and other functions in one of the financial engineering platform. Department of Higher Education which has issued "Mathematics Specialty Development Strategy Research Report" also pointed out that a considerable

number of mathematics graduates, will turn into the cross discipline or other research fields. The core of these fields is mathematics. Therefore, a strong math skills talent will be great helpful. In financial mathematics, mathematical economics, actuarial science, a longer history of cross discipline, some new cross disciplines such as financial information, financial engineering, information processing, software engineering, also need a number of mathematical talent. It is necessary and meaningful to open the financial mathematics in the local undergraduate colleges. It needs more scientific, advanced, reasonable theory and practice, as well as ceaseless exploration suiting oneself characteristic and localization of teaching mode.

Through practice, we obtained the following results. (1) The cultivation of applied talents as the goal, to explore and practice for local universities financial mathematics practice teaching system, equal to the college to provide reference. (2) Promote the combination of theory and practice of the teaching mode, and improve students' practice ability, innovation ability and the ability of application mathematics. Perfect financial mathematics core curriculum practice teaching content, reality of base oneself upon the establishment of financial simulation laboratory course practice teaching link: Establish and improve the practice teaching content, according to the latest the training plan, do practice teaching 100% open side edge modification, implementation, related to the preparation of the practical teaching in the course of the report. Curriculum practice teaching: Students actively participate in various events, including mathematical modeling, mathematical knowledge competition, financial investment simulation competition, related skills competition, computer program competition, English contest, the challenge cup competitions, and achieved excellent results, and improve students' practical ability, innovation ability, thinking and problem solving ability. (3) The reform and innovation of practice mode, aiming at the practical course, try cooperation teaching, to strengthen their links with enterprises, in addition to the current Loudi city and enterprise contact, try to go into the big city, headquarters of large enterprises, including research, establishes the stable employment counterparts, delivery of outstanding graduates, improving local universities in the development of local economy influence, to teach, learn, seamless docking.

We will go to Shanghai Securities Futures Company headquarters, including other large financial firms to conduct research to understand the demand for talent; the project group discussions on the development of "topic implementation plan" and the specific work plan. It determines the financial mathematics core curriculum group in each course for teachers, who are responsible for their own curriculum research by setting the practical teaching plan, the final work summary and communication, audit practice teaching content, business interaction, and cooperation opportunities; arrange the 10 financial mathematics class graduation practice and problems encountered in the process as well as the improvement measures; prepare core courses practice teaching experiment report, at the same time, the laboratory teaching effect and subject need to be summarized in the process of practical teaching; contact the enterprises to implement the cooperation study; undertake the task of interim summary; implement the 11 financial class graduation practice, and explore the new practice mode of cooperative achievements. It is necessary to establish the relevant associations among students.

The Nobel Economics Prize has been repeatedly granted to those economists who use mathematical tools to analyze financial problem said Professor WANG Duo from Department of Financial Mathematics, Peking University. Unfortunately, the cultivation of our country just started. WANG Duo thinks what we lack most is the advanced composite talents who master modern financial derivatives and can do quantitative analysis of financial risks; that is to say they master not only mathematics but also finance. It is a new topic the major faces to improve the practical teaching of financial mathematics and cultivate high-quality talents with qualified practical theory and practical ability of operating. This paper mainly put up with some suggestions on how to perform effective practical teaching from inside and outside of financial mathematics curriculum. I hope it can offer some references for equivalent institutions on financial mathematics.

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